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Mean time to extinction for discrete-time population dynamics (離散時間的な個体群動態における平均絶滅 時間)

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We propose the procedure to obtain the discrete-time Markov processes corresponding to the discrete-time deterministic population dynamics models. The motivation of our study comes from the present state that the only few papers deal with it while the continuous-time Markov processes corresponding to the continuous-time deterministic ones have been well studied in various literatures from fundamentals to applications [1]. Our idea is based on the so-called “first principles of population dynamics”, which can derive population dynamics models in terms of the spatial distribution and the reproduction for each individual [2]. We obtain the result for the discrete-time Markov process corresponding to Ricker model that the mean extinction time is not always longer for larger initial population size.

References

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